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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/501,202
Filing Date: February 10, 2000
Appellant(s): KLEIN ET AL.

Michael R. Cammarata
For Appellant

EXAMINER'S ANSWER

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This is in response to the appeal brief filed 17 August 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claim 5 and its base claim 1 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

Appellant's brief includes a statement that claim 13 and its base claim 12 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

Appellant's brief includes a statement that claim 21 and its base claim 12 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

Appellant's brief includes a statement that claim 18 and its base claim 14 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

Appellant's brief includes a statement that claim 27 and its base claim 24 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,370,146	Higgins et al.	4-2002
6,301,254	Chan et al.	10-2001
6,366,556	Ballintine et al.	4-2002
5,500,857	Nakata	3-1996

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3, 6-11, 14-16, 19, 20 and 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al. (US 6,370,146) in view of Chan et al. (US 6,301,254).

Regarding claims 1-3, 6, 7, 14-16, 19 and 23-29, Higgins discloses a method of non-disruptive addition of a new node to an inter-nodal network. The system includes a master node that is capable of sending control messages to the other, non-master nodes. This master node represents the ring hub node of the present invention. To add a new node, the master node instructs the two neighbor nodes to operate in loopback mode, and the network portion between the neighbor nodes is physically disconnected. This provides a bypass for traffic on the ring while the new node is then physically connected to the ring (col. 3, lines 51-67). The new node receives instructions from the host while the inter-nodal network is configured to include the new node (col. 4, lines 1-13). Higgins discloses that after insertion of a new node, the neighbor nodes are returned to open mode and verification is made that the new node and neighbor nodes have open ports (col. 4, lines 35-43). After returning to open mode, the new node can be configured to transmit and receive packets to and from the inter-nodal network (col. 4, lines 44-47). Higgins discloses that in open mode, each of the nodes receives packetized information through port A and transmits packetized information to the other nodes through port B (col. 6, lines 62-65). This meets the limitation of passing through traffic before the new node configures its connections, but Higgins fails to expressly disclose passing virtual paths through the new node or communicating these virtual paths to the other nodes on the network. Higgins also fails to disclose providing the new node connection information for all of the virtual paths and virtual

circuits on the ring. Higgins also fails to disclose removing a failed node and tearing down virtual connections to that failed node. Chan discloses a method for protecting virtual paths on a ring network that includes an Intra-Ring Communications (IRC) protocol that includes the function of adding/deleting a node to/from the ring (col. 5, line 66 – col. 6, line12). When a new node is added, Look-Up Tables (LUT's) of each node are updated to reflect the new sequential numbering of the nodes in the ring (col. 8, line 67 – col. 9, line 6). The updating of the LUT's is accomplished so that previously configured VPs are able to bypass the newly added node (col. 9, lines 16-19). The Look-Up Tables (LUTs) in each node are also updated so that previously configured virtual paths (VPs) are eliminated if destined for a deleted node (col. 9, lines 16-19). Chan also discloses a Virtual Path Identifier (VPI) table and a Virtual Circuit Identifier (VCI) table (see Figure 4). These tables are used to make routing decisions at each node. At the time the invention was made, it would have been obvious to a person of ordinary skill to provide the new node with information for all of the virtual paths and virtual circuits on the ring by of the VPI table, VCI table and lookup tables of Chan, and to tear down connections for failed nodes. It would also have been obvious to communicate the virtual path of the new node to the other nodes in the network by updating their respective tables. One of ordinary skill in the art would have been motivated to do this in order to properly route traffic around the ring in accordance with the updated topology, i.e. addition of a new node or removal of a failed node.

Regarding claims 8-10, the teaching provided thus far by Higgins et al. (US 6,370,146) in view of Chan et al. (US 6,301,254) meets all of the limitations of claim 8-10, except for establishing connections to and from the given node over the assigned virtual path and tearing down connections over the assigned virtual path. Chan discloses an ATM network that makes

use of Virtual Path Identifier (VPI) table that contains call setup information (see Figure 4). Also, it is well known in the art to establish connections and tear down connections over virtual paths in an ATM network. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to establish and tear down connections to and from the given node in the system provided by Higgins et al. in view of Chan et al. One of ordinary skill in the art would have been motivated to do this in order to allow calls to be routed through the network.

Regarding claim 11, the teaching provided thus far by Higgins et al. in view of Chan et al. provides all of the limitations of claim 11, except for shaping traffic over the virtual circuits. It is well known in the art of ATM networks to perform traffic shaping per virtual circuits. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include this feature in the system provided by Higgins et al. in view of Chan et al. One of ordinary skill in the art would have been motivated to do this to allow traffic of different classes to pass through the ring while receiving certain guaranteed levels of service.

Regarding claim 20, Higgins discloses that each frame (50) on the inter-nodal network begins with an inter-nodal control word (64), which is used to effect certain control functions between nodes (col. 7, lines 31-49). This control work represents the inter-ring management channel of the present invention.

Regarding claim 22, Higgins discloses a master node that acts like the hub node of the present invention, as described above. Higgins fails to expressly disclose that the master node detects the failure of a failed node. Chan discloses that any node in the ring may detect a failure (col. 9, line 52- col. 10, line 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art for the master node of Higgins to detect the failure of a

failed node in the system provided by Higgins et al. in view of Chan et al. provided thus far. One of ordinary skill in the art would have been motivated to do this because the master would be required to know whether to loopback its transmission to a particular node so that information is not lost on the ring.

Claims 4 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al. (US 6,370,146) in view of Chan et al. (US 6,301,254), as applied to claims 1-3, 6-11, 14-16, 19, 20 and 22-29 above, and further in view of Ballintine et al. (US 6,366,556).

Regarding claims 4 and 17, the teaching of Higgins et al. in view of Chan et al. provides all of the limitations of claims 4 and 17, except for an error checking code. Ballintine discloses an Incoming Error Code (IEC) in the Path Overhead (POH) on a SONET ring (col. 9, lines 1-8). Incoming Error Counts (IEC-1 to IEC-4) keep track of parity error counts to identify incoming failures to a virtual ring path segment (col. 9, lines 17-38). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this error checking feature in the system provided by the teaching of Higgins et al. in view of Chan et al. One of ordinary skill in the art would have been motivated to do this in order to be sure that the path through the newly inserted node was operating correctly once traffic started to be routed through the new node.

Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al. (US 6,370,146) in view of Chan et al. (US 6,301,254), as applied to claims 1-3, 6-11, 14-16, 19, 20 and 22-29 above, and further in view of Nakata (US 5,500,857).

Regarding claims 5 and 18, the teaching of Higgins et al. in view of Chan et al. provides all of the limitations of claims 5 and 18, except that the given node requests the assignment to the hub node and the hub node responds with the assignment. Nakata discloses a ring with a plurality of nodes, including a control node (see Figure 2). A node may generate a request to a control node. The control node makes an assignment and informs the requesting node (col. 1, line 58 – col. 2, line36). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art for a node to make a request to a control node, or ring hub node as in the present invention, and receive an assignment therefrom. One of ordinary skill in the art would have been motivated to do this in the system provided by the teaching of Higgins et al. in view of Chan et al. because the master node, or ring hub node, would have information about all of the virtual paths and virtual circuits on the ring and thus be able to make a determination of which assignments may be made to the new node.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al. (US 6,301,254).

Regarding claim 12, Chan discloses an Intra-Ring Communications (IRC) protocol that includes the function of deleting a node from the ring and communicating ring failure status to the other nodes in the ring (col. 8, line 49-55). The Look-Up Tables (LUTs) in each node are updated so that previously configure virtual paths (VPs) are eliminated if destined for a deleted node (col. 9, lines 16-19). Chan fails to expressly disclose tearing down virtual circuit connections. However, Chan does disclose maintaining Virtual Circuit Identifier (VCI) tables for maintaining virtual circuit information at each node (see Figure 4). At the time the invention

was made, it would have been obvious to a person of ordinary skill in the art to tear down or eliminate virtual circuit connections directed to a failed node. One of ordinary skill in the art would have been motivated to do this because virtual connections destined to a deleted node would no longer have a path through which to travel.

Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al. (US 6,301,254), as applied to claim 12, and in further view of Higgins et al. (US 6,370,146).

Regarding claims 13 and 21, the teaching provided by Chan in the previous rejection of claim 12 provides for any node in the ring to detect a failure (col. 9, line 52- col. 10, line 9). Chan also provides all the other limitations of claim 13, except that a hub node determines the node failure and controls the tearing down of virtual circuits and virtual paths. Higgins provides a ring system with a host (4) that may be implemented within a node (col. 6, lines 24-30). The host controls the overall operation of the system and communicates with the nodes to direct call processing functions such as making connections (col. 6, lines 14-23). In this way, the host functions like the ring hub node of the present invention. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art for the host to determine the failure and to perform the tearing down of virtual circuits and virtual path connections. One of ordinary skill in the art would have been motivated to do this because the host would have all of the necessary information to perform the tearing down of connections without having to retrieve this information from other nodes.

(11) Response to Argument

A. The rejection of claims 1-4, 6-11, 14-17, 19, 20, 22-26, and 29 under 35 U.S.C. 103(a).

Appellant argues that the combination of Higgins and Chan fails to teach or suggest "operating a given node as a pass through for ATM traffic on other existing virtual path connections on the ring before a virtual path is established for the given node", as required by independent claims 1 and 14. Claim 24 presents a similar requirement of "to operate as a pass through... until one or more new virtual paths are established for the newly-inserted node."

The Examiner has relied on Higgins to provide this "pass through" limitation, specifically col. 4, lines 35-47, which the Appellant has quoted in the arguments regarding this limitation in the Appeal Brief. Appellant correctly asserts the Examiner equates the "open mode" of Higgins with acting as a "pass through" as required by claims 1, 14, and 24. However, Appellant disagrees with this interpretation of Higgins.

According to Appellant, a new node 6d is configured to transmit and receive packets only after receiving an acknowledgement and final verfication from the master node, thus Higgins fails to disclose operating the new node 6d as a pass through until after it is fully configured for service. The Examiner disagrees with this interpretation. Appellant relies on col. 4, lines 44-45, "Thereafter, the new node can be configured to transmit and receive packets *to and from the inter-nodal network*". Appellant has misinterpreted the phrase "*to and from the inter-nodal network*" to mean the new node cannot pass through packets already on the inter-nodal network from one neighbor node through the new node to another neighbor node. Higgins clearly discloses that the new node, once physically connected, can in fact pass through traffic already on the inter-nodal network. Higgins states "After the two neighbor nodes return to open mode...

a final verification is performed to ascertain that the new node or nodes as well as the neighbor nodes have open ports", col. 4, lines 35-43. According to this disclosure, the nodes neighboring the newly added node return to open mode *before* the final verification. Higgins defines open mode in col. 6, lines 62-65; see also Figure 2:

> In open operating mode, each of nodes 6a through 6c receives packetized information through port A and transmits packetized information to the other nodes through port B as indicated by the solid arrows.

This "open operating mode" is justly equated with the "pass through" operation of the present invention in light of the previous quotation. Higgins discloses additional evidence of the urgency to pass through traffic before the aforementioned final verification is performed in col. 9, lines 36-42:

> After both neighbor nodes, such as the neighbor nodes 6a and 6c of FIG. 2, have simultaneously looped back their ports, the physical connection of the new node 6d into the network 12 can take place. The new node 6d must be prepared, however, for entry into an active inter-nodal network. It is desired that the new node 6d operate as if it had always been part of the network 12.

Furthermore, the specific process of returning to open mode from loopback mode and bringing the new node into service is outlined in Higgins in col. 10, line 49 – col. 11, line 45. To show the order of events Higgins first discloses in col. 11, lines 18-21:

> The neighbor nodes, now with their respective I/O ports open, read control word 64 until each node receives the EXPNTK_COMPLETED message 312. This verifies that the inter-nodal network is intact.

Then, after the inter-nodal network is intact, the new node may transition to a running state in which it may make its own connections, as discloses in col. 11, lines 29-33:

> At this point, under normal conditions, there are no looped back I/O ports in any node on the inter-nodal network 12. In order to enable the new node 6d to come into service (e.g., make connections, etc.), that node must transition to the RUNNING state 116 (FIG. 8).

It is clear that Higgins does in fact meet the limitation of "operating a given node as a pass through for ATM traffic on other existing virtual path connections on the ring before a virtual path is established for the given node". In order to efficiently achieve the addition of a new node to an inter-nodal network Higgins discloses an open mode to pass through traffic before the new node is verified to make its own connections. Therefore, the Examiner submits that the rejection of claims 1-4, 6-11, 14-17, 19, 20, 22-26, and 29 must be sustained.

B. The rejection of claims 5 and 18 under 35 U.S.C. 103(a).

Appellant argues that there is no teaching, motivation, or suggestion that would cause one of ordinary skill in the art to combine Nakata with Higgins and Chan. The Examiner disagrees with the asserted lack of motivation.

Claims 5 recites the limitation, "the given node requesting the assignment from a hub node, and the hub node responding to the request with the assignment", and claim 18 similarly recites, "requesting, at the given node, the assignment from a hub node, and responding to the request, at the hub node, with the assignment". Higgins in view of Chan discloses that a newly added node comes into service (e.g. makes connections) by transitioning to a running state in col. 11, lines 32-34. Higgins discloses an inter-nodal ring suitable for ATM traffic in col. 6, lines 8-13, and Chan discloses the use of virtual paths (VPs) on a ring network. Thus, in the combination of Higgins in view of Chan, the connections that a new node in the running state would be making require a virtual path assignment. This new node does not have any knowledge of the VPs on the inter-nodal network to which it has been added. In order to make connections it needs to somehow be assigned a VP. Nakata discloses nodes on a ring network

that communicate via assigned optical wavelengths. A node generates a request to transmit data in col. 1, lines 59-60, and a control node responds with a wavelength assignment from its managed wavelength table col. 2, lines 6-16. In view of this reference, it is obvious for the new node to request its VP assignment from the master node of Higgins so that the new node may make its desired connections.

There is clearly a motivation for combining Nakata with Higgins and Chan, since Nakata provides a node a way to obtain the necessary resources to transmit on a ring, i.e. by making a request to a control node. The Examiner submits that that the rejection of claims 5 and 18 must be sustained.

C. The rejection of claim 12 under 35 U.S.C. 103(a).

Appellant argues that Chan fails to teach or suggest "determining, at a ring hub node, that a node has failed," and "providing instructions to other nodes on the ring to update ring topology information… that the failed node is removed from the ring", as required by claim 12. Appellant has misquoted the first limitation of claim 12, "determining, at a ring hub node, …",. The actual claim limitation does not recite anything about a ring hub node. The claim states only the limitation of "determining that a node has failed".

Appellant asserts that since Chan does not disclose specifically detecting that a failure occurred in a node (as opposed to detecting a path failure), there can be no teaching or suggestion in Chan of removing a node based on such a detected failure. The Examiner disagrees with this argument. Chan does in fact teach the specific detection of a node failure in col. 14, lines 55-67:

Second, when there is a complete SONET switch module failure 1100, such as the complete failure of the DAS#4 126. For example, the failure of the DAS#4 126 causes a communication failure in the DAS#4's 126 SONET_N card 130, the DAS#4's SONET_S card 132, the DAS #1's 120 SONET_N card 950, and the DAS#3's 124 SONET_S card 930. All links into and out of the DAS#4 126 are treated as failed. When the DAS#4 126 fails, the DAS#1's 120 SONET_N card 950 detects 1110 the failure and notifies 1120 the downstream nodes on the CCW ring 162. The DAS#3's 124 SONET_S card 930 also detects 1130 the failure and notifies 1140 the downstream nodes on the CW ring 160.

As also disclosed by Chan, "... the DASs 120-126 are generally referred to as SONET nodes 140-150...", thus the quotation cited above clearly discloses the detection of a failed node, as opposed to detecting a path failure. Chan claims a "Virtual Path Ring VPR protection method for Asynchronous Transfer Mode ATM traffic" that includes the step of "protecting said VP connections by an Intra-Ring Communication protocol" in claim 1, col. 15 lines 40-41 and lines 52-53. In claim 9, which depends from claim 1, Chan also claims that the protecting step includes "deleting one of said SONET VPR nodes from the SONET UPSR" in col. 17, lines 27-28.

Appellant also argues that Chan teaches away from performing protection switching by updating the LUTs of the nodes based on the affected virtual paths (VPs) in col. 10, lines 15-27. The Examiner agrees that Chan teaches it is "not feasible" to perform the protection switching by updating the LUTs, as the time it would take to accomplish the updating would be "prohibitively long". However, Chan discloses that the updating of the LUTs is accomplished so that previously configured VP's are eliminated *if destined for a deleted node* in col. 9, lines 16-19. It is clear the updating is performed on a node that has already been deleted. This meets the limitation of claim 12 that states, "providing instructions to other nodes on the ring to update ring topology information at the other nodes, the updated ring topology information indicating that the failed node is removed from the ring".

Chan does teach the aforementioned limitations of "determining that a node has failed," and "providing instructions to other nodes on the ring to update ring topology information... that the failed node is removed from the ring", as shown above. The Examiner submits that the rejection of claim 12 must be sustained.

D. The rejection of claims 13 and 21 under 35 U.S.C. 103(a).

Appellant argues that there is no teaching, suggestion, or motivation to modify Chan to include a host, such as the one provided by Higgins. Appellant also argues that Higgins does not teach that the host is "implemented within a node", rather the host is an entity in communication with the nodes of the inter-nodal network. According to Appellant, this proposed modification of Chan to include a host fails to teach the use of a ring hub node to determine that a node has failed. The Examiner disagrees with these arguments.

Chan discloses that any node on the ring may detect a failure and communicate this failure to other nodes in col. 9, line 52 – col. 10, line 9. Chan does not disclose a ring hub node, therefore Chan also does not disclose a ring hub node for detecting a failure or a ring hub node for tearing down the virtual connections. Higgins remedies this deficiency with a host that controls the overall operation of the system and is "used to configure the nodes as well as to direct call processing functions such as making connections and providing communication services", as discloses in col. 6, lines 14-23. This host meets the limitation of a ring hub node as in the present invention. Additionally, Higgins discloses that "a host can be implemented as a printed circuit card that is physically connected *within a node*" in col. 6, lines 24-30. This definitely meets the limitation of being "implemented within a node". It is obvious to include

the host of Higgins in the system of Chan to provide control for the ring network. As stated in the response to arguments regarding claim 12, Chan provides for the deletion of a node and the tearing down of connections to a deleted node. It is obvious for the host of Higgins in combination with the ring system of Chan to provide the tearing down of connections, since the host controls the overall operation of the system.

The Examiner submits that the combination of Chan in view of Higgins is properly motivated and does teach a host that is "implemented within a node", thus the rejection of claims 13 and 21 must be sustained.

E. The rejection of claims 27 and 28 under 35 U.S.C. 103(a).

Appellant applies the same arguments to claims 27 and 28 that were presented for claim 12. The Examiner hereby incorporates by reference the above response to arguments regarding claim 12, which have demonstrated Chan's teachings related to detecting a node failure, and removing the failed node based on the detected failure. Accordingly, the Examiner submits that the rejection of claims 27 and 28 must be sustained.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

TEV
November 23, 2004

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